

REMARKS

Claims 1 and 9 have been amended. Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned "Version with markings to show changes made." Claims 1-3, 6-10, and 12-18 remain pending. Applicant reserves the right to pursue the original claims and other claims in this application and in other applications.

Applicant's representative appreciates the allowance of claims 12-16, as noted in paragraph 7 of the Office Action. While claims 17-18 are not listed as being allowed in paragraph 7 of the Office Action, these claims are listed among the allowed claims on the PTO-326. Applicant's representative therefore requests the Examiner to confirm the allowance of claims 17-18 in the next Office Action.

Claims 1-3 and 7-10 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Sugawara (U.S. Patent No. 4,946,252) in view of Hed (U.S. Patent No. 5,247,390). Claim 6 stand rejected under 35 U.S.C. § 103 as being unpatentable over Sugawara, Hed, and Hoch (U.S. Patent No. 6,002,520). These rejections are respectfully traversed.

The present invention is directed at an optical beam homogenizer which includes a transmissive or reflective element having an exterior surface which is irregularly shaped on one side. The irregular shapes are caused by a large plurality of optical elements formed in the surface. For example, micro wedges may be formed upon one surface of the element. The optical elements differ in size and shape, so that adjacent elements refract or reflect

light in different ways. The collective shapes of the plurality of optical elements may be such that the refracted or reflected light forms a predetermined angular pattern of homogenized light. See Fig. 1, element 18. The present invention utilizes a plurality of differently sized and shaped optical elements formed upon the same substrate to form an homogenized beam of light having a predetermined angular pattern.

Sugawara discloses a focusing screen for a single lens reflex camera. Column 1, lines 5-8. The focusing screen is comprised of a plurality of compound lenses 22 formed over a glass substrate 20 arranged to form a honeycomb structure. Column 2, lines 58-66; column 5, lines 29-42; Figs. 1A, 1B, and 2. Each of the compound lenses 22 is formed from concave conical section 24 and a convex conical section 22, and arranged so that the two cones share a common axis S and cross each other such that their apices align on the common axis. Column 5, lines 37-58.

With respect to claims 1-2 and 6-10, the Office Action alleges that Sugawara discloses every element of these claims except for the use of a planar output surface (although in claim 6, Sugawara also fails to disclose a lens for performing a Fourier transform operation). It should be noted, however, that the compound lenses of Sugawara, which are comprised of convex and concave cones, cannot be microwedges since cones have circular surfaces and wedges have planar surfaces.

The Office Action relies upon Hed for teaching the use of a planar output surface. Hed discloses a refractive diffuser comprising two films. Column 2, lines 37-48. Each film includes a flat surface and another surface, which may be concave, convex, or

planar. Column 4, lines 63-65. The films are arranged such that the flat surfaces form the exterior (i.e., the output) surfaces of the diffuser, while the concave, convex, or planar surfaces of each film face each other. Column 6, line 43 - column 7, line 18. Like Sugawara, Hed fails to teach or suggest the use of microwedges.

Claims 1 and 9, as amended, now recite an optical device having “an irregularly shaped exterior output surface.” Claim 1 further requires the surface to be comprised of first and second optical elements, wherein each of said elements are “microwedges” and have “planar output surfaces.” Similarly, claim 9 further requires the surface to be comprised of adjacent optical elements, wherein each of the elements are “microwedges formed upon a same substrate and have planar output surfaces.” As noted above, the cited prior art is devoid of any teachings or suggestions with respect to the use of microwedges as optical elements. Furthermore, the cited prior art is also devoid of any teachings or suggestions with respect to an optical device having “an irregularly shaped exterior output surface” comprising optical elements having “planar output surfaces.” Claims 1 and 9 are therefore believed to be allowable. Claims 2-3 and 6-8 (which depend from claim 1) and claims 10-11 (which depend from claim 9) are also believed to be allowable over the prior art of record for these reasons and because the combination defined in the claims is not shown or suggested by the cited references.

Finally, please note that the canceled and/or amended claims have been canceled and/or amended in this case solely for the purpose of furthering the prosecution of the present application. Applicant reserves the right to claim the subject matter of the canceled

claims, the claims pending prior to this Amendment, and/or the subject matter of other claims embodied in this application, or any continuation, division, CPA, reissue, reexamination or other application. Any amendments made to the application are not made for the purpose of distinguishing the claims over prior art, except as specifically discussed in the Remarks section of this paper.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. And there are additional reasons why the claims should be allowable beyond those mentioned above. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue.

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Respectfully submitted,

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Version With Markings to Show Changes Made

Please rewrite claims 1 and 9 as follows:

1. (Amended Twice) An optical device, comprising:

an irregularly shaped exterior output surface, further comprising,

a first optical element for directing a first portion of an incident light beam in a predetermined first direction; and

a second optical element for directing a second portion of said incident light beam in a predetermined second direction,

wherein

said second direction is [being] different than said first direction,

said second optical element is [being] adjacent said first optical element, [and wherein]

said first optical element is of a first shape, said second optical element is of a second shape, said first shape is different from said second shape, said first and second shapes being microwedges, and

said first optical element and said second optical element have planar output surfaces and are formed upon a same substrate.

9. (Amended Twice) An optical system, comprising:

a light source for providing a light beam; and

an optical device for homogenizing said beam, said optical device including an
irregularly shaped exterior output surface further comprising,

adjacent optical elements for forming respective non-adjacent portions of an
angular pattern, [and]

wherein said optical elements are microwedges formed upon a same substrate and have
planar output surfaces and different three-dimensional configurations.